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CASE REPORT

Polyarticular Juvenile Idiopathic Arthritis leading to Renal Amyloidosis

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Abstract

The incidence and prevalence of renal amyloidosis is rare. We are presenting a case of 21 year 21-year-old male with multiple joint pain complicated by adult-onset Nephrotic Syndrome due to renal amyloidosis. The patient improved on medications.

Keywords: Renal Amyloidosis, Polyarticular Juvenile Idiopathic arthritis (JIA), Nephrotic syndrome

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Introduction

Juvenile idiopathic arthritis (JIA) is the most common systemic inflammatory disease of the connective tissue in the pediatric age group [1]. It is classified into several groups based on the number of joints involved along with other clinical and laboratory parameters. One such subset is polyarticular JIA which is characterized by involvement of greater than 4 joints in age less than 16 years.

Amyloidosis is characterized by the systemic deposition of amyloid fibrils. It has many subtypes. One such subtype secondary Amyloidosis caused by the overproduction of the precursor of AA protein [2,3].

Renal amyloidosis has been described in systemic onset JIA, followed by polyarticular JIA [3,4]. Renal amyloidosis has an insidious progress. Initially, there is massive proteinuria which later leads to end-stage renal disease. Hematuria is rarely seen in this condition [3,5]. Asymptomatic proteinuria is the most common initial symptom [2]. Therefore, routine urinalysis should be performed in those who have systemic JIA or polyarticular JIA. Amyloidosis is confirmed by renal biopsy which demonstrates amyloid fibrils.

Case Report

The case is about a 21-year-old male who presented to us with bilateral pedal edema from the last 6 years. For the last 2 years, he has been taking medications from a local practitioner. He also gave a history of frothy urine without any hematuria or decreased urine output or fever.

On examination, there was pallor and bilateral pitting pedal edema. Investigations revealed normal blood counts and renal function tests. Serum albumin was low (2.2g/dl). Total Cholesterol, LDL, and Triglyceride levels were high (429mg/dl,147 mg/dl and 235 mg/dl respectively). Urine routine and microscopy showed 3+ proteinuria with no RBCs. 24-hour urinary protein was quantified as 4.1g/day. Ultrasound of the kidney, ureters and bladder showed bilateral normal-sized kidneys and normal echogenicity with normal cortico-medullary differentiation.

He had joint pains involving the small joints of his hands including metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints over the past 6 years. He had no fever nor had any rash over his body. There was swelling and deformity of fingers. ESR and CRP were raised (ESR-48 mm in 1st hour and CRP- 22mg/dl respectively). Rheumatoid Factor, anti-CCP, and ANA came out to be negative. Diagnosis of polyarticular JIA was made based on the above findings.

The patient was taken up for renal biopsy which revealed glomeruli with diffuse irregular mesangial matrix expansion with staining with IHC for SAA protein showing intense (3+) positivity along glomerular and extraglomerular sites of amyloid deposition. Electron microscopy showed focal effacement of visceral epithelial foot processes with mesangial and subendothelial aggregates of randomly oriented fibrillary structures and no immune complex type electron-dense deposits in glomerular basement membrane or mesangial areas. The patient was started on steroids at 1 mg/kg (40 mg) and gradually tapered over 4 months to maintenance dose of 7.5 mg, with methotrexate 15 mg weekly , HCQS 200 mg once a day and diuretics. He was followed up for 9 months. After 9 months,

his joint pain and pedal edema had subsided with a reduction in 24-hour urinary protein (1.9g/day). His serum albumin improved to 3.4 g/dl. ESR and CRP came back to normal and Urine routine and microscopy showed 1 + proteinuria and no RBCs were seen.

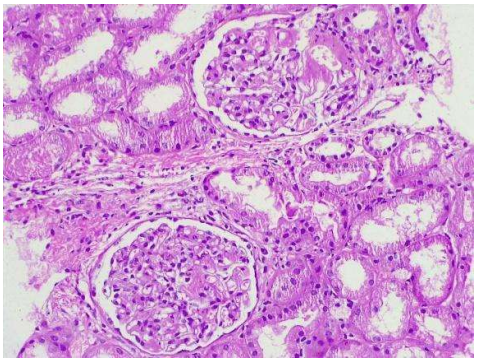

Figure 1. Light microscopy showing expansion of mesangial matrix due to deposition of amyloid (eosinophilic on HE stain at 10x)

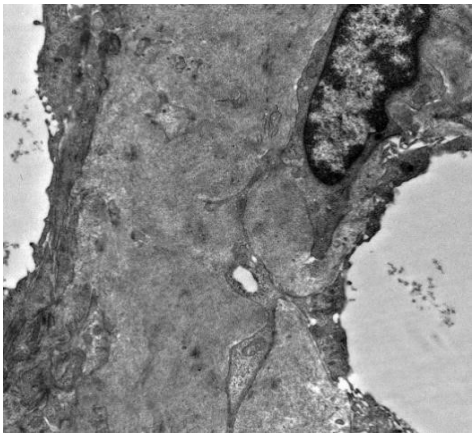

Figure 2. Electron Microscopy showing effacement of foot processes

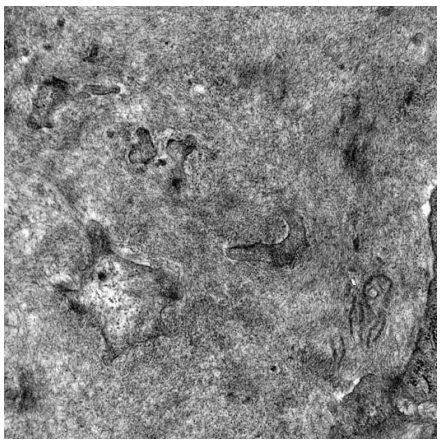

Figure 3. Mesangial and subendothelial aggregates of randomly oriented fibrillary structures measuring about 9-12 nm in diameter

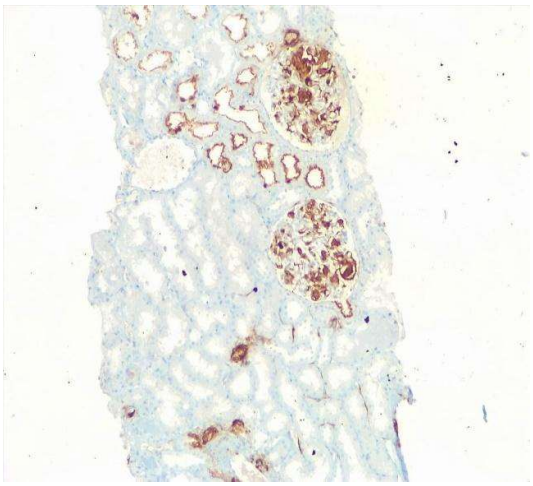

Figure 4. IHC for SAA protein shows intense (3+) positivity along glomerular and extraglomerular sites of amyloid deposition

Discussion

In children, amyloidosis involving the kidneys is rarely seen. The prevalence of renal amyloidosis is higher in patients suffering from JIA compared to the general population [6]. Amyloidosis is described in systemic JIA and polyarticular JIA due to chronic inflammation [6]. In developed countries not many cases of renal amyloidosis are seen [7]. The time duration between the onset of JIA and progression to amyloidosis has been reported to be approximately 8 years [6].

Evidence regarding the management of secondary amyloidosis is scarce and treatment mainly focuses on managing the underlying etiology. Adequate control of underlying disease needs to be achieved. TNF-α inhibitors, IL-1 inhibitors, and Chlorambucil have shown promising results. Tocilizumab has been used extensively in systemic JIA with some success. However clinical remission of proteinuria may not be achieved, and this condition would require prolonged therapy with periodic monitoring [7]. Tocilizumab may be an important therapeutic strategy in such cases where amyloidosis is not completely resolved.

In our case, there was symptomatic proteinuria, and the patient did not have any hematuria. The patient responded to steroids and DMARDs. There are rare publications on patients with systemic JIA having Amyloidosis and even rarer on the association of Polyarticular JIA with amyloidosis.

Conclusion

Renal amyloidosis is an uncommon yet important complication of polyarticular JIA. Clinicians should be vigilant in monitoring renal function in JIA patients. Timely recognition and appropriate management with the available options can improve outcomes.

Statements and Declarations

Conflicts of interest

The authors declares that they do not have conflict of interest.

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References

1. Zaripova LN, Midgley A, Christmas SE, Beresford MW, Baildam EM, Oldershaw RA. Juvenile idiopathic arthritis: from aetiopathogenesis to therapeutic approaches. Pediatr Rheumatol Online J. 2021 Aug 23;19(1):135. doi: 10.1186/s12969-021-00629-8.
2. Bilginer Y, Akpolat T, Ozen S. Renal amyloidosis in children. Pediatr Nephrol 2011;26:1215-27.
3. Immonen K, Savolainen A, Kautiainen H, Hakala M. Longterm outcome of amyloidosis associated with juvenile idiopathic arthritis. J Rheumatol 2008;35:907-12.
4. David J, Vouyiouka O, Ansell BM, Hall A, Woo P. Amyloidosis in juvenile chronic arthritis: a morbidity and mortality study. Clin Exp Rheumatol 1993;11:85-90.
5. Dhillon V, Woo P, Isenberg D. Amyloidosis in the rheumatic diseases. Ann Rheum Dis 1989;48:696-701.
6. Packham JC, Hall MA. Long-term follow-up of 246 adults with juvenile idiopathic arthritis: functional outcome. Rheumatology (Oxford). 2002;41(12):1428–35.
7. Bilgnier Y, Akpolat T, Ozen S. Renal amyloidosis in children. Pediatr Nephrol. 2011;26:1215–27.